

Amendments to the Claims

This Listing of Claims replaces all prior versions, and listings, of claims in this application.

1-98 (Cancelled).

99. (New) A soldering iron tip, comprising:

a heat-conducting core;

a metal particle sintered member connected to the core to transfer heat therefrom to thereby form a working end of the soldering iron tip;

wherein the metal particle sintered member includes a sintering base material or a sintering base material and a sintering additive; and

wherein the content of the sintering base material in the metal particle sintered member is between 60% and 99.99%.

100. (New) The soldering iron tip of claim 99 wherein the core is a heat-conducting copper or copper alloy core.

101. (New) The soldering iron tip of claim 99 wherein the sintering base material includes at least one of iron particles, nickel particles, and cobalt particles.

102. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member consists essentially of iron particles.

103. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member consists essentially of iron and cobalt particles.

104. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member consists essentially of iron and nickel particles.

105. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member consists essentially of iron, nickel and cobalt particles.

106. (New) The soldering iron tip of claim 99 wherein iron particles used for the sintering base material have a purity of no less than 99.5%.

107. (New) The soldering iron tip of claim 99 wherein the content of iron particles in the metal particle sintered member is greater than 60% by weight, if iron is included as an intentionally added constituent.

108. (New) The soldering iron tip of claim 99 wherein the content of iron particles in the metal particle sintered member is greater than 60% by weight.

109. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member is a cap having a wall thickness of 200 to 800 microns.

110. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member includes the sintering base material and the sintering additive, and the sintering additive is at least one of silicon particles, copper particles, silver particles, tin particles, boron particles, ceramic particles, and carbon particles.

111. (New) The soldering iron tip of claim 110 wherein the content of the sintering additive in the metal particle sintered member is between 0.01% and 40%.

112. (New) The soldering iron tip of claim 99 wherein the soldering iron tip is adapted to be provided as a replaceable suction nozzle on a main body having a heating element.

113. (New) The soldering iron tip of claim 99 wherein the soldering iron tip is adapted to be provided on a main body having a heating element.

114. (New) The soldering iron tip of claim 99 wherein the core includes a tapered portion and the metal particle sintered member is a cap on an end of the tapered portion.

115. (New) The soldering iron tip of claim 114 further comprising silver particle/powder paste sandwiched between the cap and the tapered portion.

116. (New) The soldering iron tip of claim 114 wherein the cap is formed on the tapered portion.

117. (New) The soldering iron tip of claim 114 wherein the cap is only on a forward tip of the tapered portion.

118. (New) The soldering iron tip of claim 114 wherein the tapered portion includes a tip end and a connecting portion connecting the tip end to a base portion of the core, and the cap is on the tip end but not the connecting portion.

119. (New) The soldering iron tip of claim 99 wherein the core includes a cylindrical member formed separately from the metal particle sintered member and to which the metal particle sintered member is secured.

120. (New) The soldering iron tip of claim 99 wherein the core includes a cylindrical body member and a forward end, the metal particle sintered member comprises a cap fitting on and covering at least substantially the entire forward end, and the cap is brazed to the forward end.

121. (New) The soldering iron tip of claim 99 wherein the metal particles used in the sintered member and any sintering member additive particles have particle sizes no greater than 200 μm .

122. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member includes a first layer and a second layer, and wherein the first layer defines the outer surface of the distal tip of the metal particle sintered member.

123. (New) The soldering iron tip of claim 99 wherein the core comprises a pipe and the metal particle sintered member comprises a forward end member which is brazed to the pipe.

124. (New) The soldering iron tip of claim 99 wherein the core includes an end socket and the metal particle sintered member is an elongated member having its proximal end affixed in and to the socket.

125. (New) The soldering iron tip of claim 99 wherein the core includes a proximal end, female-threaded cavity for threading the soldering iron tip in position.

126. (New) The soldering iron tip of claim 99 wherein the core includes a forward end having a through-passageway, and the metal particle sintered member is on the forward end and has an opening communicating with the through-passageway.

127. (New) The soldering iron tip of claim 126 wherein the metal particle sintered member includes a sleeve extending into the through-passageway.

128. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member is an iron cap, the core includes a forward extension member, and the iron cap is brazed to a forward tip end of the extension member with silver paste sandwiched between the iron cap and the extension member.

129. (New) The soldering iron tip of claim 99 wherein the core includes a base portion and a forward extension portion, and the metal particle sintered member is at an end of the forward extension portion, and further comprising a top coating on the forward extension portion but not on a working tip end of the metal particle sintered member.

130. (New) The soldering iron tip of claim 129 wherein the top coating is not wettable by solder, and wherein a tin or tin alloy coating on the working tip end has good wettability by solder.

131. (New) The soldering iron tip of claim 129 wherein the top coating is a ceramic material, a cermet material or a metal.

132. (New) The soldering iron tip of claim 129 further comprising an undercoating between the top coating and the forward extension portion, the undercoating having a heat expansion rate which is greater than that of the top coating and less than that of the material of the core.

133. (New) The soldering iron tip of claim 129 further comprising a sealing coating on the top coating.

134. (New) The soldering iron tip of claim 129 wherein the top coating extends forward a short distance onto a rearward portion of the metal particle sintered member.

135. (New) The soldering iron tip of claim 99 wherein the core has a base portion which has a rearwardly-extending cavity and an Ag-Al-Cu alloy coating layer in the cavity.

136. (New) The soldering iron tip of claim 99 wherein the core has a base portion which has a rearwardly-extending cavity and an aluminum oxide film in the cavity.

137. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member includes iron, nickel, silver and copper particles.

138. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member consists essentially of iron and copper particles.

139. (New) The soldering iron tip of claim 99 wherein the core has a core forward surface and an end nub extending out from the surface, wherein the metal particle sintered member is joined to the nub and extends out therefrom, and wherein the metal particle sintered member includes a base ring which encircles the nub.

140. (New) The soldering iron tip of claim 99 wherein the metal particle sintered member consists essentially of iron and carbon particles.

141. (New) The soldering iron tip of claim 99 wherein the sintering base material and the sintering additive together comprise granulated alloy particles.

142. (New) The soldering iron tip of claim 99 wherein the core includes a tapered portion, wherein the metal particle sintered member comprises a cap having a wall thickness of 200 to 800 microns, wherein the inner and outer surfaces of the cap have the same tapered shape, and wherein the cap is positioned on the tapered portion.

143. (New) A soldering iron tip, comprising:
a heat-conducting core;

a particle sintered member connected to the core to transfer heat therefrom to thereby form a working end of the soldering iron tip;

wherein the particle sintered member comprises a sintering base material and a sintering additive;

wherein the sintering additive comprises at least one of silicon particles, copper particles, silver particles, tin particles, boron particles, ceramic particles, and carbon particles; and

wherein the content of the sintering additive in the particle sintered member is between 0.01% and 40%.

144. (New) The soldering iron tip of claim 143 wherein the core is a heat-conducting copper or copper alloy core.

145. (New) The soldering iron tip of claim 143 wherein the core includes a tapered portion and the particle sintered member is a cap on an end of the tapered portion.

146. (New) The soldering iron tip of claim 145 further comprising silver particle/powder paste sandwiched between the cap and the tapered portion.

147. (New) The soldering iron tip of claim 145 wherein the cap is formed on the tapered portion.

148. (New) The soldering iron tip of claim 145 wherein the particle sintered member is only on a forward tip of the tapered portion.

149. (New) The soldering iron tip of claim 145 wherein the tapered portion includes a tip end and a connecting portion connecting the tip end to a base portion of the core, and the cap is on the tip end but not on the connecting portion.

150. (New) The soldering iron tip of claim 143 wherein the core includes a cylindrical member formed separately from the particle sintered member and to which the particle sintered member is secured.

151. (New) The soldering iron tip of claim 143 wherein the core includes a cylindrical body member and a forward end, the particle sintered member comprises a cap fitting on and covering at least substantially the entire forward end, and the cap is brazed to the forward end.

152. (New) The soldering iron tip of claim 143 wherein the particles used in the particle sintered member have a particle size no greater than 200 μm .

153. (New) The soldering iron tip of claim 143 wherein the particle sintered member includes a first layer and a second layer, and wherein the first layer defines the outer surface of the distal tip of the particle sintered member.

154. (New) The soldering iron tip of claim 143 wherein the core comprises a pipe and the particle sintered member comprises a forward end member which is brazed to the pipe.

155. (New) The soldering iron tip of claim 143 wherein the core includes an end socket and the particle sintered member is an elongated member having its proximal end affixed in and to the socket.

156. (New) The soldering iron tip of claim 143 wherein the core includes a forward end having a through-passageway, and the particle sintered member is on the forward end and has an opening communicating with the through-passageway.

157. (New) The soldering iron tip of claim 156 wherein the particle sintered member includes a sleeve extending into the through-passageway.

158. (New) The soldering iron tip of claim 143 wherein the particle sintered member is an iron cap, the core includes a forward extension member, and the iron cap is brazed to a forward tip end of the extension member with silver paste sandwiched between the iron cap and the extension member.

159. (New) The soldering iron tip of claim 143 wherein the core includes a base portion and a forward extension portion, and the particle sintered member is at an end

of the forward extension portion, and further comprising a top coating on the forward extension portion but not on a working tip end of the particle sintered member.

160. (New) The soldering iron tip of claim 143 wherein the core has a base portion which has a rearwardly-extending cavity and an Ag-Al-Cu alloy coating layer in the cavity.

161. (New) The soldering iron tip of claim 143 wherein the core has a base portion which has a rearwardly-extending cavity and an aluminum oxide film in the cavity.

162. (New) The soldering iron tip of claim 143 wherein the particle sintered member includes iron, nickel, silver and copper particles.

163. (New) The soldering iron tip of claim 143 wherein the particle sintered member consists essentially of iron and copper particles.

164. (New) The soldering iron tip of claim 143 wherein the core includes a proximal end threaded cavity for threading the soldering iron tip in position.

165. (New) The soldering iron tip of claim 143 wherein the core includes a proximal end, female-threaded cavity for threading the soldering iron tip in position.

166. (New) The soldering iron tip of claim 143 wherein the particle sintered member is configured as a cap having a wall thickness of 200 to 800 microns.

167. (New) The soldering iron tip of claim 143 wherein the sintering base material includes iron particles having a purity of no less than 99.5%.

168. (New) The soldering iron tip of claim 143 wherein the core has a core forward surface and an end nub extending out from the surface, wherein the particle sintered member is joined to the nub and extends out therefrom, and wherein the particle sintered member includes a base ring which encircles the nub.

169. (New) The soldering iron tip of claim 143 wherein the core comprises a pipe, wherein the particle sintered member comprises a forward end member which is brazed

to the pipe, and wherein the forward end member includes a rearward nub which is secured into a forward end of the pipe.

170. (New) The soldering iron tip of claim 143 wherein the particle sintered member consists essentially of iron and carbon particles.

171. (New) The soldering iron tip of claim 143 wherein the sintering base material comprises at least one of iron particles, nickel particles and cobalt particles.

172. (New) The soldering iron tip of claim 143 wherein the soldering iron tip is adapted to be provided on a main body having a heating element.

173. (New) The soldering iron tip of claim 143 wherein the soldering iron tip is adapted to be provided as a replacement suction nozzle on a main body having a heating element.

174. (New) The soldering iron tip of claim 143 wherein the sintering base material and the sintering additive together comprise granulated alloy particles.

175. (New) The soldering iron tip of claim 143 wherein the core includes a tapered portion, wherein the particle sintered member comprises a cap having a wall thickness of 200 to 800 microns, wherein the inner and outer surfaces of the cap have the same tapered shape, and wherein the cap is positioned on the tapered portion.

176. (New) A soldering iron tip, comprising:

 a heat-conducting core;

 a metal particle sintered member connected to the core to transfer heat therefrom to thereby form a working end of the soldering iron tip;

 wherein the metal particle sintered member includes a first layer and a second layer;

 wherein the first layer defines the outer surface of the distal tip of the member; and

 wherein the second layer is sintered from at least one of copper alloy particles, copper particles and copper chromium particles.

177. (New) The soldering iron tip of claim 176 wherein the core is a heat-conducting copper or copper alloy core.

178. (New) The soldering iron tip of claim 176 wherein the second layer is sintered from copper particles or copper chromium particles.

179. (New) The soldering iron tip of claim 176 wherein the first layer includes a sintering base material and a sintering additive.

180. (New) The soldering iron tip of claim 179 wherein the sintering base material and the sintering additive together comprise granulated alloy particles.

181. (New) The soldering iron tip of claim 179 wherein the sintering base material includes at least one of iron particles, nickel particles, and cobalt particles.

182. (New) The soldering iron tip of claim 179 wherein the content of the sintering base material is between 60% and 99.99%.

183. (New) The soldering iron tip of claim 176 wherein the second layer defines a body member having a tapered end and the first layer defines a cap on the tapered end.

184. (New) The soldering iron tip of claim 176 wherein the second layer defines a rear body member and the first layer defines a forward tapered tip member which interlocks with the rear body member.

185. (New) The soldering iron tip of claim 176 wherein the core includes a cylindrical member formed separately from the metal particle sintered member and to which the metal particle sintered member is secured.

186. (New) The soldering iron tip of claim 176 wherein the metal particle sintered member is a cap having a wall thickness of 200 to 800 microns.

187. (New) The soldering iron tip of claim 176 wherein the first layer comprises a sintering base material and a sintering additive, and wherein the sintering additive is at

least one of silicon particles, copper particles, silver particles, tin particles, boron particles, ceramic particles, and carbon particles.

188. (New) The soldering iron tip of claim 187 wherein the content of the sintering additive in the first layer is between 0.01% and 40%.

189. (New) The soldering iron tip of claim 176 wherein the metal particles used in the metal particle sintered member have particle sizes no greater than 200 μm .

190. (New) The soldering iron tip of claim 176 wherein the core comprises a pipe and the metal particle sintered member comprises a forward end member which is brazed to the pipe.

191. (New) The soldering iron tip of claim 176 wherein the core includes at its rearward end a female threaded portion.

192. (New) The soldering iron tip of claim 176 wherein the core includes a forward end having a through-passageway, and the metal particle sintered member is on the forward end and has an opening communicating with the through-passageway.

193. (New) The soldering iron tip of claim 192 wherein the metal particle sintered member includes a sleeve extending into the through-passageway.

194. (New) The soldering iron tip of claim 176 wherein the core includes a base portion and a forward extension portion, and the metal particle sintered member is at an end of the forward extension portion, and further comprising a top coating on the forward extension portion but not on a working tip end of the metal particle sintered member.

195. (New) The soldering iron tip of claim 176 wherein the core has a base portion which has a rearwardly-extending cavity and an Ag-Al-Cu alloy coating layer in the cavity.

196. (New) The soldering iron tip of claim 176 wherein the core has a base portion which has a rearwardly-extending cavity and an aluminum oxide film in the cavity.

197. (New) The soldering iron tip of claim 176 wherein the first layer includes iron, nickel, silver and copper particles.

198. (New) The soldering iron tip of claim 176 wherein the first layer consists essentially of iron and copper particles.

199. (New) The soldering iron tip of claim 176 wherein the first layer consists essentially of iron and cobalt particles.

200. (New) The soldering iron tip of claim 176 wherein the metal particle sintered member consists essentially of iron and carbon particles.

201. (New) The soldering iron top of claim 176 wherein the core includes a proximal end threaded cavity for threading the soldering iron tip in position.

202. (New) The soldering iron tip of claim 176 wherein the core has a core forward surface and an end nub extending out from the surface, wherein the metal particle sintered member is joined to the nub and extends out therefrom, and wherein the metal particle sintered member includes a base ring which encircles the nub.

203. (New) The soldering iron tip of claim 176 wherein the core comprises a pipe, wherein the metal particle sintered member comprises a forward end member which is brazed to the pipe, and wherein the forward end member includes a rearward nub which is secured into a forward end of the pipe.

204. (New) The soldering iron tip of claim 176 wherein the core includes a tapered portion, wherein the first layer comprises a cap having a wall thickness of 200 to 800 microns, and wherein the inner and outer surfaces of the cap have the same tapered shape.